Luer-lock misconnects can be deadly

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LUER FITTINGS, connectors, and locks are small, inexpensive, and convenient. These devices can easily connect many medical devices, components, and accessories. Unfortunately, because they're so easy to use, clinicians may mistakenly connect the wrong devices, delivering a substance through the wrong route. Such an error can cause serious injury or death.

What can go wrong?

The Food and Drug Administration (FDA) has received reports of enteral feeding tubes mistakenly connected to I.V. lines and tracheal tube pilot balloons. Other reported errors involving luer connections include connecting oxygen tubing to endotracheal tube pilot balloons, noninvasive blood pressure (BP) cuffs connected to I.V. lines, and drugs intended for I.V. administration given intrathecally. Many similar adverse events may not have been reported because the event was attributed to user error.

Here are a few examples of reports submitted to the FDA adverse event report database:

Case 1. While a patient was being repositioned, his I.V. tubing became disconnected. It was then inadvertently reconnected to the inflation port of his trach cuff. One hour later, he suffered respiratory arrest and died. Approximately 20 ml of I.V. fluid had infused into his trach cuff, causing an acute airway obstruction.

Case 2. A patient injured in a car accident was intubated in the ED. Unable to tolerate extubation, she underwent a tracheotomy during her hospitalization. A nurse and respiratory therapist checked her after transfer from the critical care unit. Later a visitor reported that she was having difficulty breathing. Attempts to suction failed. The tracheostomy tube's inner cannula was removed, but the suction catheter still couldn't be advanced. Investigation revealed that her I.V. tubing had been inadvertently connected to the trach cuff's pilot balloon port, overinflating the cuff and partially collapsing the tracheostomy tube.

Case 3. A patient came to the ED because of nausea, vomiting, and rectal bleeding. An I.V. catheter was placed in anticipation of a computed tomography scan, but no I.V. fluids or medications had been started. The patient also had a noninvasive automatic BP cuff placed for continuous BP monitoring. The BP cuff tubing was disconnected when he went to the bathroom and reconnected upon his return. His wife found him "blue from the neck up." Despite resuscitation efforts, he died. The BP tubing had been connected to the I.V. catheter and delivered about 15 ml of air. An autopsy confirmed a fatal air embolism.

Case 4. A ventilator-dependent patient was receiving enteral nutrition after aortic aneurysm repair. The enteral nutrition tubing was inadvertently connected to the central line after a diagnostic test. The patient received approximately 45 ml of enteral feeding solution intravenously. According to the FDA adverse event report, the patient's clinical status is unknown.

What precautions can you take?

- Educate all clinical staff who use luer devices about the hazards of misconnecting tubing and devices.
- Teach clinical staff to first carefully inspect and then follow the proper connector sequence when connecting tubing and device components.
- Read and follow the equipment manufacturers' recommendations and precautions, especially regarding compatibility with other devices.
- Don't modify I.V. or feeding devices because doing so may compromise the safety features built into their design.
- Tell patients they must ask clinical staff for help when they need to disconnect and reconnect equipment. A patient or family member could easily connect the wrong devices.
- Report known or suspected misconnections to the appropriate person in your facility and to the FDA through its MedWatch reporting program. (See below.)
- At your facility, join committees that are responsible for choosing products. Then encourage these committees to choose safety-designed devices to eliminate or reduce the risk of misconnections.

SELECTED REFERENCES

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Paparella S. Inadvertent attachment of a blood pressure device to a needleless IV "Y-site": Surprising, fatal connections. *Journal of Emergency Nursing*. 31(2):180-182, April 2005.

Although you need to support the adverse event–reporting policy of your health care facility, you may voluntarily report a medical device that doesn't perform as intended by calling MedWatch at 1-800-FDA-1088 (fax: 1-800-FDA-0178) or online at **http://www.fda.gov/medwatch/how.htm**. The opinions and statements in this report are those of the authors and may not reflect the views of the Department of Health and Human Services.

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